Implementation of an Energy Management System in Colombian Manufacturing – A Methodological Approach

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1. Introduction

How to implement mechanisms for industry 4.0 models?

- Remove greenhouse gases from the environment
- High energy consumption worldwide
- Consuming patterns
- Energy efficiency and operational efficiency
- Mining as a component of economic influence
II. Background

Opportunities in the implementation of Industry 4.0 technologies

- AMI
- IoT, Big Data, Machine Learning
- Smart industries
- Mixed working model
- Characterization of energy demand
- Help for KPI calculation

User section
- Type of industry
- Machinery age
- Maintenance program

Time section
- Production and use of machinery based on peak demand hours
- Hour
- Day
- Month
- Year

Space section
- Factory Building
- Climatic condition

Source: Our elaboration
III. Proposed methodology

Ontologies as a study proposal

- Explicit description of concepts in the industrial sector in this case
- Planning, modeling and implementation
- Identify sources of information and availability of databases
- Technological implementation capacity

Ontology development process

Source: Semantic Meta Model for the Description of Resource and Energy Data in the Energy Data Management Cycle
IV. Case study

High energy consumption in the mining sector

- Energy consumption by the mining sector represents 25% of the total consumed by unregulated users
- Adaptive models with energy efficiency
- High energy consumption such as the shredding line
- Relationship between sensors, meters and motor machinery
- Optimal processes for energy efficiency

Source: aimixtrituradora.com
V. Partial conclusions

• New challenges in the field of data analytics

• It is possible to reduce the electricity consumption used to ontologies that allow approaching between multiple intelligent systems

• The production models may or may not be similar in terms of the type of machinery used to be analyzed from the ontologies

• It is possible to incorporate data on energy consumed in a productive context with EnMS and ontologies
VI. Questions